MCGWC file

5 April 1967

MEMORANDUM FOR: General John M. Reynolds

SUBJECT: Collection of KH-4 Photography in Support of Mapping and Charting

1. On 14 April 1965 the Board approved a requirement for the collection of photography of approximately 18 million square nautical miles of territory outside the Soviet Bloc and Communist China to be used in the production of maps and charts. The concept held at that time was that this photography would be acquired by two KH-4 missions per year devoted primarily to this purpose and supplemented by 5-20 per cent of the film on regular KH-4 missions. This concept was followed for about a year. During this time, however, it became apparent that this concept was not the most efficient way of meeting the requirement. A study of the problem indicated that during the life of a typical KH-4 mission something on the order of 30-40 percent of the film could be used effectively in areas of good weather inside the Bloc and a roughly comparable portion of film would normally be available for areas of good weather outside the Bloc. The remaining portion of the film would be used under less favorable weather conditions whether inside or outside the Bloc. It was decided, therefore, to adopt a new concept for the collection of the coverage required in support of mapping and charting. This concept was to authorize the NRO to use the maximum per cent of film both inside and outside of the Bloc whenever a good weather opportunity presented itself over areas that had not been covered previously. Subsequent experience with this concept indicated that between 20 and 40 per cent of the film on a standard KH-4 mission was expended for mapping and charting photography outside the Bloc at no apparent degradation in the fulfillment of search and surveillance requirements inside the Bloc. It has also been demonstrated that this concept for the collection of mapping and charting photography has been successful in covering large quantities of the areas requiring coverage.

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2. Experience has shown that the main problem in acquiring coverage outside of the Bloc has been the weather encountered in the Equatorial Belt. This area tends to be cloud covered most of the time. Cloud free areas are small and infrequent. The only way to get the necessary coverage in this area is to maximize the number of opportunities to take photography in order to take advantage of the cloud free areas as they open up. The earlier concept of using the special missions for mapping and charting purposes did not provide enough opportunities and consequently very little coverage was obtained in the Equatorial Belt. The new concept, however, provides many more opportunities and some progress has been made in acquiring the necessary coverage although it is obvious it will take many years to complete the coverage of the Equatorial Belt.

3. At the present time the status of coverage expressed in square nautical miles required for mapping and charting purposes is as follows:

	USSR/EuSats/Chi	Equatorial Belt	Remainder
Area requiring coverage as of April 1965	8,513,000	6,100,000	12,662,000
Collected by 1039J	43,000	99,000	387,000
Total collection to date	8,233,000	850,000	9,464,000
Remaining to be covered	280,000	5,250,000	3,198,000

4. As a result of our experiences with this program COMOR has concluded that KH-4 missions should be flown solely when required for the satisfaction of search and surveillance requirements inside the Bloc and that the collection of photography for mapping and charting purposes will be achieved at a commensurate rate. We believe that this approach results in a more efficient use of satellite reconnaissance vehicles, that it offers an acceptable prospect for the ultimate satisfaction of mapping and charting requirements, and that it reduces the complexity of the decisions involved in formulating requirements for KH-4 missions.

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Chairman
Committee on Overhead Reconnaissance

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MC&WG file

4 April 1967

25X1 MEMORANDUM FOR: [redacted]

SUBJECT: Re-evaluation of Maps and Geodetic Data in IPC Listings with Reference to MC&G Satellite Photography

1. You asked whether there still is a need for continuing the current priority requirements established by the IPC for acquiring maps and geodetic data from the Communist countries in view of the possibility that the past and current program for the collection by satellite photography of data for mapping, charting, and geodetic purposes might have substantially reduced the need for the IPC priorities in these fields. 25X1 [redacted] asked me to look into this matter. I have consulted with several men directly involved, and the results of these discussions, are provided in the following paragraphs.

2. There is a strong conviction that the acquisition of sheets from modern large scale map series, especially some of those published by the USSR and Communist China, would be of primary significance in the geodetic field. For example, one or preferably several scattered sheets of the Soviet 1:100,000 or larger scale series, would be of great value in verifying the accuracy of some of the control points used in establishing the geodetic net over denied areas by use 25X1 of [redacted] other frame photography.

3. The ability to obtain rather precise coordinates from Soviet maps for control points that are recognizable on satellite photography would result in adjustments that would strengthen or tighten the geodetic net over the denied areas. The more points thus verified from Soviet map sheets in different parts of the USSR, the greater would be accuracy of our geodetic net for Soviet Union.

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5. Clearly, it is generally accepted that the Soviet geodetic system and the coordinates of Soviet maps have a high degree of accuracy. Enough is known to justify Soviet successes in these fields. A unified coordinate system covers the whole territory of the USSR, based on the Krasovskiy ellipsoid with the initial point being the 1942 Pulkovo datum. The Gauss-Kruger (tranverse mercator) projection is used in computing coordinates for the maps. In Western USSR and eastward along the Trans-Siberian railroad with extensions into neighboring areas there is good ground triangulation with high geodetic accuracies. In more isolated areas, the accuracy is less because of the more "relaxed" methods used there by the Soviets in conducting geodetic surveys.

6. Although the Communist Chinese have their own ellipsoid with Peiping 1954 as their initial point or datum, it is assumed that this ellipsoid ties in with and fits the Soviet ellipsoid. The accuracies of coordinates on post 1954 Chinese maps are believed to be equivalent to Soviet maps. Therefore, newer large scale map sheets published in Communist China would have equal utility in the verification process described above.

7. The priority for acquiring maps of peripheral areas, including particularly those of the Eastern European states, should not be minimized. They would greatly help in strengthening the tie between the Western European and the Pulkovo geodetic systems.

8. Catalogues that provide comprehensive listings of astronomic and gravimetric observations and geodetic positions and triangulation data in denied areas should be judged as being very useful sources of information in determining point locations to help the verification process.

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10. For the above reasons, I recommend that the requirements in the two lists remain essentially unchanged, except for possible clarification by some rewording and the scrubbing of the last item in both lists, since they have been overtaken by our advanced collection techniques.

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